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INVESTIGATION OF ATMOSPHERIC PROPERTIES BASED UPON
EVALUATION OF INFRARED RADIATION DATA OBTAINED FROM
TIROS SATELLITES

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1. INVESTIGATIONS BEING UNDERTAKEN :

- a. A method allowing the determination of tropospheric relative humidity and of radiation temperatures of underlying surfaces has been developed during the past period of this grant. This method now has been applied on TIROS III radiation data from Julian days 0 - 3. For this a computer program usable together with data tapes (FERT) had to be developed. The results are plotted in synoptic maps for each day.
- b. It has been tried to derive the daily variations of surface temperature from the radiation data measured during successive orbits over the same geographic area. Again radiation data from Julian days 0 - 3, measured over areas where the subsatellite paths overlap have been used.
Some statistical investigations were undertaken to show the magnitude of errors adhering to the data.
- c. The outgoing fluxes have been calculated for overlapping bands of different atmospheric gases. This has been done on the basic of graphical integration. Three model atmospheres were used and assumptions were made about the vertical structure of the distribution of single gases. A computer program has been developed to show the influence of different parameters on the outgoing radiation: this program was particularly valuable in using a finer subdivision of the spectral intervals as well as in the study of the influence of a finer vertical structure of the atmosphere.

All numerical calculations have been done with the help of the IBM 7090 computer of the "Institut für Plasma-physik" at Garching/München.

2. REPORTS :

- a. A first Scientific Interim Report has been submitted in July 1963 by F. Möller and E. Raschke : "Evaluation of TIROS III Infrared Radiation Data".
- b. The final report for the period from 1 October 1963 - 31 March 1964 has been submitted by F. Möller and E. Raschke : "Evaluation of TIROS III Infrared Radiation Data".
- c. A scientific Interim report is in preparation and will be submitted early in 1965.

3. FUTURE WORK :

- a. It will be tried to derive informations on the relative humidity of the lower troposphere from radiation data of TIROS VII. - Investigations reported here in chapter 1a and 1b will be completed and published in a second interim report in the next year.
- b. The investigations on the influence of different parameters on the outgoing radiation will be continued. Additionally we will investigate the possibility and the accuracy of deriving the structure of the atmosphere from measurements in spectral regions with overlapping bands.

4. PERSONNEL AND ADMINISTRATIONS :

Project Director :	Prof. Dr. F. Möller
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	Dipl.-Phys. I. Tannhäuser
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